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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ZHENG, EVA Y	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/879,831	HOTTINEN ET AL.	
	Examiner	Art Unit	
	Eva Yi Zheng	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-102* is/are pending in the application.

4a) Of the above claim(s) *1,2,33 and 34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-32 and 35-102* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/13/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. The request filed on July 28, 2005, for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 09/879,831 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Objections

2. Claim 100 is objected to because of the following informalities: please delete the last three lines in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 3-7, 9-12, 16-31, 35-39, 41-42, 46-56, 71-77, and 85-100 are rejected under 35 U.S.C. 102(e) as being anticipated by Harrison (US 6,154,485).

a) Regarding claim 3, Harrison discloses a method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter (50 in Fig. 1) transmitting at least a part of the signal via at least two different transmit antenna paths (116 and 118 in Fig. 1); and

the receiver receiving the signal (56 in Fig. 1);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter by means of changeable weighting coefficients determined for each transmit antenna path (90, 92 in Fig. 1; Col 3, L27-31);

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths (124, 126, 136 and 138 in Fig.1);

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements (149 in Fig. 1);

wherein the transmitter forms weighting coefficients by means of the weighting coefficient data signaling (90, V0 and 92, V1 in Fig.1);

wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received, the quality value for the weighting coefficient data signaling relating to the quality of the channel in which the weighting coefficient data is signaled from the receiver to the transmitter (Col 4, L27-37); and

wherein the transmitter forms weighting coefficients by means of the quality value of the weighting coefficient data signaling and the signaling itself (as shown in Fig.1; Col 4, L27-37).

b) Regarding claims 4, 36, 74 and 96, Harrison discloses the values of the weighting coefficients are predetermined, and the predetermined values of the

weighting coefficients are divided into different groups, each of which has a particular weighting coefficient for each transmit antenna path, the weighting coefficient data signaling comprising information about which group of weighting coefficients the receiver wants to be used (Col 5, L31-45; also see US pat. No.:6,067,324).

c) Regarding claims 5, 37, 75 and 97, Harrison discloses the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted (Col 3, L59-Col 4, L23).

d) Regarding claims 6, 38, 76 and 98, Harrison discloses the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially (Col 5, L31-45; also see US pat. No.:6,067,324).

e) Regarding claims 7, 39, 77 and 99, Harrison discloses the weighting coefficient data comprises at least one channel parameter measured by the receiver (149 in Fig.1; Col 4, L27-37).

f) Regarding claim 9, Harrison discloses the weighting coefficients used in the transmission are signaled to the receiver (as shown in Fig. 1).

g) Regarding claim 10, Harrison discloses the weighting coefficients are signaled to the receiver by means of an identification sequence which is inserted in the transmitted signal and which varies depending on the weighting of the signal (90 and 92 in Fig.1).

h) Regarding claim 11, Harrison discloses the weighting coefficients are signaled to the receiver using modulation, spreading or coding of the signal specifically for each transmit antenna path (76 and 98 in Fig.1).

i) Regarding claims 12 and 42, Harrison discloses the identification data for the group of weighting coefficients used in the transmission is signaled to the receiver using identification bits inserted in the transmitted signal (104 and 106 in Fig.1).

j) Regarding claims 16, 46 and 84, Harrison discloses signals to be transmitted via two different transmit antenna paths are as mutually orthogonal as possible (Col 1, L21-26).

k) Regarding claim 17, Harrison discloses the orthogonality is implemented by using a different spreading or channel code for each transmit antenna path (Col 1, L21-26).

l) Regarding claim 18, Harrison discloses the orthogonality is implemented by using a different transmission frequency for each transmit antenna path (Col 1, L21-26).

m) Regarding claim 19, Harrison disclose the orthogonality is implemented by using a different slot for each transmit antenna path (Fig. 1).

n) Regarding claims 20, 47 and 85, Harrison disclose the signal is coded in order to minimize transmission errors in the transmission channel (as shown in Fig.1).

o) Regarding claims 21, 48 and 86, Harrison disclose the coding is space time coding (as shown in Fig.1).

p) Regarding claims 22, 49 and 87, Harrison disclose the space-time coding is space-time block coding (as shown in Fig.1).

q) Regarding claims 23, 50 and 88, Harrison disclose the space-time coding is space-time trellis coding (a type of transmit diversity inherent to employ space-time trellis coding).

r) Regarding claims 24, 51 and 89, Harrison disclose the transmit antenna paths are connected to one base station of the network part in the radio system (56 in Fig. 1).

s) Regarding claims 25, 52 and 90, Harrison disclose the transmitter is situated in a radio network subsystem of the radio system network part (Fig. 1), and the receiver is situated in a user equipment of the radio system (Fig. 1).

t) Regarding claims 26, 53 and 91, Harrison disclose a user equipment of the radio system determines the weighting coefficients (90 and 92 in Fig. 1) used by the network part of the radio system in transmitting to the user equipment in question.

u) Regarding claims 27, 54 and 92, Harrison disclose the network part of the radio system determines itself the weighting coefficients it uses in transmission (Fig. 1).

v) Regarding claims 28, 55 and 93, Harrison disclose the network part of the radio system takes into account the loading of each power amplifier over the transmit antenna path when it makes the decision (Col 1, L27-32).

w) Regarding claim 29, 56 and 94, Harrison disclose a transmit antenna path is implemented by means of an antenna structure that provides phasing (as shown in Fig.1).

x) Regarding claim 30, Harrison disclose the phasing is determined by means of channel parameters signalled by the receiver (124,126,128, 130, 148 in Fig.1).

y) Regarding claim 31, Harrison disclose wherein the phasing of transmission is determined by means of signals that have arrived at the same antenna elements (Fig. 1).

z) Regarding claim 35, Harrison disclose a radio system for transmitting a digital signal, comprising:

a transmitter for transmitting a signal (52 in Fig. 1);

at least two transmit antenna paths that can be connected to the transmitter (116 and 118 in Fig. 1);

a receiver for receiving the signal (56 in Fig. 1);

wherein the transmitter comprises

changing means (149 in Fig.1) for changing the weighting coefficients determined for each transmit antenna path with respect to one another, and

weighting means (90 and 92 in Fig. 1) for weighting the transmit power of the signals to be transmitted via different transmit antenna paths by means of weighting coefficients that can be changed with respect to one another;

wherein the receiver comprises means for performing measurements on the received signals that were transmitted via the different transmit antenna paths, and means for signaling to the transmitter the weighting coefficient data formed on the basis of the measurements (124,126,136,138 in Fig.1); and

the transmitter further comprises means for receiving the weighting coefficient data signaling, and wherein the changing means form weighting coefficients using the weighting coefficients data signaling (149 in Fig.1), and

wherein the transmitter comprises means for forming a quality value for the weighting coefficient data signaling it has received, the quality value for the weighting coefficient data signaling relating to the quality of the channel in which the weighting

coefficient data is signaled from the receiver to the transmitter (Col 4, L27-37); and the changing means form weighting coefficients using the quality value of the weighting coefficient data signaling and the signaling itself (as shown in Fig.1; Col 4, L27-37).

aa) Regarding claim 41, Harrison disclose the transmitter comprises means for signaling the weighting coefficients used in the transmission to the receiver using pilot bits inserted in the transmitted signal (as shown in Fig.1).

bb) Regarding claims 95 is rejected under similar reasons for rejection of claim 35.

cc) Regarding claims 100 is rejected under similar reasons for rejection of claim 3.

dd) Regarding claims 71, 72 and 73 are rejected under similar reasons for rejection of claim 3.

3. Claims 32, 57-70, 79, 80, 101 and 102 are rejected under 35 U.S.C. 102(e) as being anticipated by Greenstin et al. (6,131,016).

a) Regarding claim 57, Greenstin et al. disclose a radio system for transmitting a digital signal, the system comprising:

a transmitter (10 in Fig. 1) for transmitting at least a part of the signal via at least two different transmit antenna paths (15 and 16 in Fig. 1); and

a receiver for receiving the signal (20 in Fig. 1);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter using changeable weighting coefficients (W1 and W2 in Fig. 2A) determined for each transmit antenna path,

wherein a transmit antenna path is implemented using an antenna structure that provides phasing (230 in Fig. 2A); and

wherein transmissions are sent from at least one antenna element with at least two different phases or antenna beams (Fig. 1).

b) Regarding claim 59 is rejected under similar reasons for rejection of claim 3 and 21.

c) Regarding claim 62, Greenstin et al. disclose wherein the receiver send weighting coefficient data to the transmitter, and the transmitter forms the weighting coefficients (W1 and W2 in Fig. 2A) for the antenna beams using the weighting coefficient data (as shown in Fig. 2A).

d) Regarding claim 64 is rejected under similar reasons for rejection of claim 3 and 4.

e) Regarding claims 61 and 66, Greenstin et al. disclose wherein weighting coefficients for the antenna beams are formed at the transmitter (as shown in Fig.1 2A).

f) Regarding claim 67, Greenstin et al. disclose wherein the receiver signals to the transmitter weighting coefficient data, and the transmitter forms the weighting coefficients for the antenna beams using the signaled weighting coefficient data (230, 202a and 203a in Fig. 2A).

g) Regarding claims 63 and 68, Greenstin et al. disclose wherein the antenna beams are adaptive and controlled with at least one of uplink signaling and measurements (as shown in Fig.1 2A).

h) Regarding claim 69, Greenstin et al. disclose a method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter (10 in Fig. 1) transmitting at least a part of the signal via at least two different transmit antenna paths (15 and 16 in Fig. 1); and

the receiver receiving the signal (20 in Fig. 1);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter (202a and 203a in Fig. 2A) by means of changeable weighting coefficients determined for each transmit antenna path (Col 4, L53- Col 5, L36);

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths (as shown in Fig.1);

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements (280 in Fig. 2B);

wherein the transmitter (220 in Fig. 2A) forms weighting coefficients by means of the weighting coefficient data signaling (201 in Fig. 2A; Col 3, L34-37);

wherein the transmitter forms a quality value for the weighting coefficient data signaling (230 in Fig. 2A);

wherein the transmit antenna paths are connected to at least two different transmission sectors of a base station in the radio system (15 and 16 in Fig. 1).

i) Regarding claim 79, Greenstin et al. disclose wherein the transmitter is further configured to signal the weighting coefficients used in the transmission to the received using pilot bits inserted in the transmitted signal (Col 5, L 8-24).

j) Regarding claim 80, Greenstin et al. disclose wherein the transmitter is further configured to signal to the receiver identification data for the group of weighting coefficients used in the transmission using pilot bits inserted in the transmitted signal (Col 5, L 8-24).

k) Regarding claims 60 and 70, Greenstin et al. disclose wherein different antenna beams have different pilot sequences, and the method further comprises:

estimating antenna beam channel parameter using the pilot sequences (Col 4, L20-52);

combining the antenna beam signals using the pilot sequences (Fig. 2B); and

calculating weighting coefficient data for the antenna beams using the pilot sequences (W1 and W2 in Fig. 2A); and

signaling the calculated weighting coefficient data to the transmitter (as shown in Fig. 2A).

l) Regarding claims 58 and 65 are rejected under similar reasons for rejection of claims 60 and 70.

m) Regarding claims 32, 101 and 102 are rejected under similar reasons for rejection of claim 57.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 8, 40, and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrison (US 6,154,485) in view of Yun (US 6,463,295).

a) Regarding claims 8, 40, and 78, Harrison discloses a method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter (50 in Fig. 1) transmitting at least a part of the signal via at least two different transmit antenna paths (116 and 118 in Fig. 1); and

the receiver receiving the signal (56 in Fig. 1);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter by means of changeable weighting coefficients determined for each transmit antenna path (90, 92 in Fig. 1; Col 3, L27-31);

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths (124, 126, 136 and 138 in Fig.1);

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements (149 in Fig. 1);

wherein the transmitter forms weighting coefficients by means of the weighting coefficient data signaling (90, V0 and 92, V1 in Fig.1).

Harrison disclose all the subject matters described above except for the specific teaching of the transmit antenna paths are connected to at least two different base stations of a network part in the radio system.

However, it is well known that base stations and mobile stations are essential in a wireless communication system. Yun, in the same field of endeavor, teaches power control of signals between the base stations and mobile stations. Therefore, it is obvious to one of ordinary skill in art at the time of the invention to realize that the communication system by Harrison would adapt more than two base stations. By doing so, simultaneously provide power estimation and signal quality control in different base stations in a wireless communication system.

7. Claims 13-15, 43, 44, 45, 81-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrison (US 6,154,485).

a) Regarding claims 13-15, 43, 44, 45, and 81-83, Harrison discloses a method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter (50 in Fig. 1) transmitting at least a part of the signal via at least two different transmit antenna paths (116 and 118 in Fig. 1);

the receiver receiving the signal (56 in Fig. 1);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter by means of

changeable weighting coefficients determined for each transmit antenna path (90, 92 in Fig. 1; Col 3, L27-31);

wherein the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths (124, 126, 136 and 138 in Fig.1);

wherein the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements (149 in Fig. 1);

wherein the transmitter forms weighting coefficients by means of the weighting coefficient data signaling (90, V0 and 92, V1 in Fig.1);

wherein the transmitter forms a quality value for the weighting coefficient data signaling it has received; (Col 4, L27-37)

wherein the transmitter forms weighting coefficients by means of the quality value of the weighting coefficient data signaling and the signaling itself (as shown in Fig.1; Col 4, L27-37).

Harrison disclose all the subject matters described above except for the specific teaching of quality value for signaling falls below a predetermined threshold value, the weighting coefficients are not changed; the weighting coefficients are set to an equal value over each transmit antenna path; and the weighting coefficient are changed.

However, Harrision implicitly discloses that the channel measurement and feedback processor controls the filter coefficient in any appropriate formats (Col 4, L24-37). Therefore, it is obvious to one of ordinary skill in art at the time of invention was made to realize the coefficients by Harrison are set in any way, which including

changing, unchanging, or equal to some threshold, that would be appropriate for the communication system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Zheng whose telephone number is 571 272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eva Yi Zheng
Examiner
Art Unit 2634

October 14, 2005

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